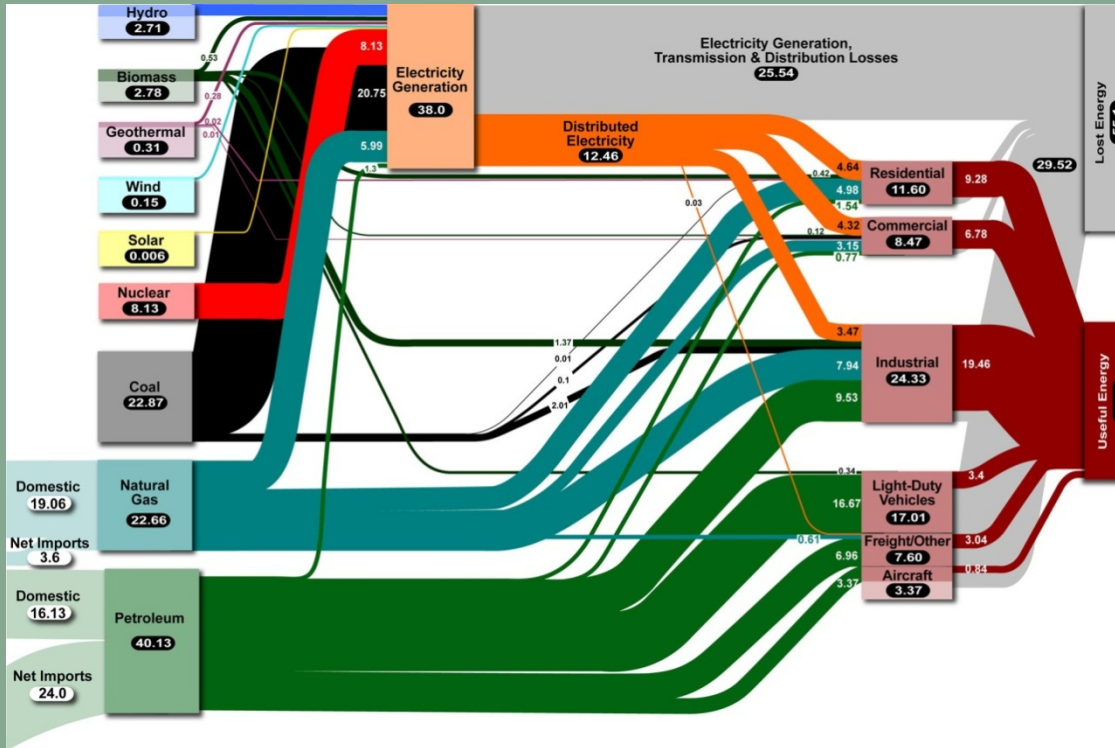


Grand Vision Regional Energy Plan



Energy Baseline Analysis

Final Results

February 15, 2013

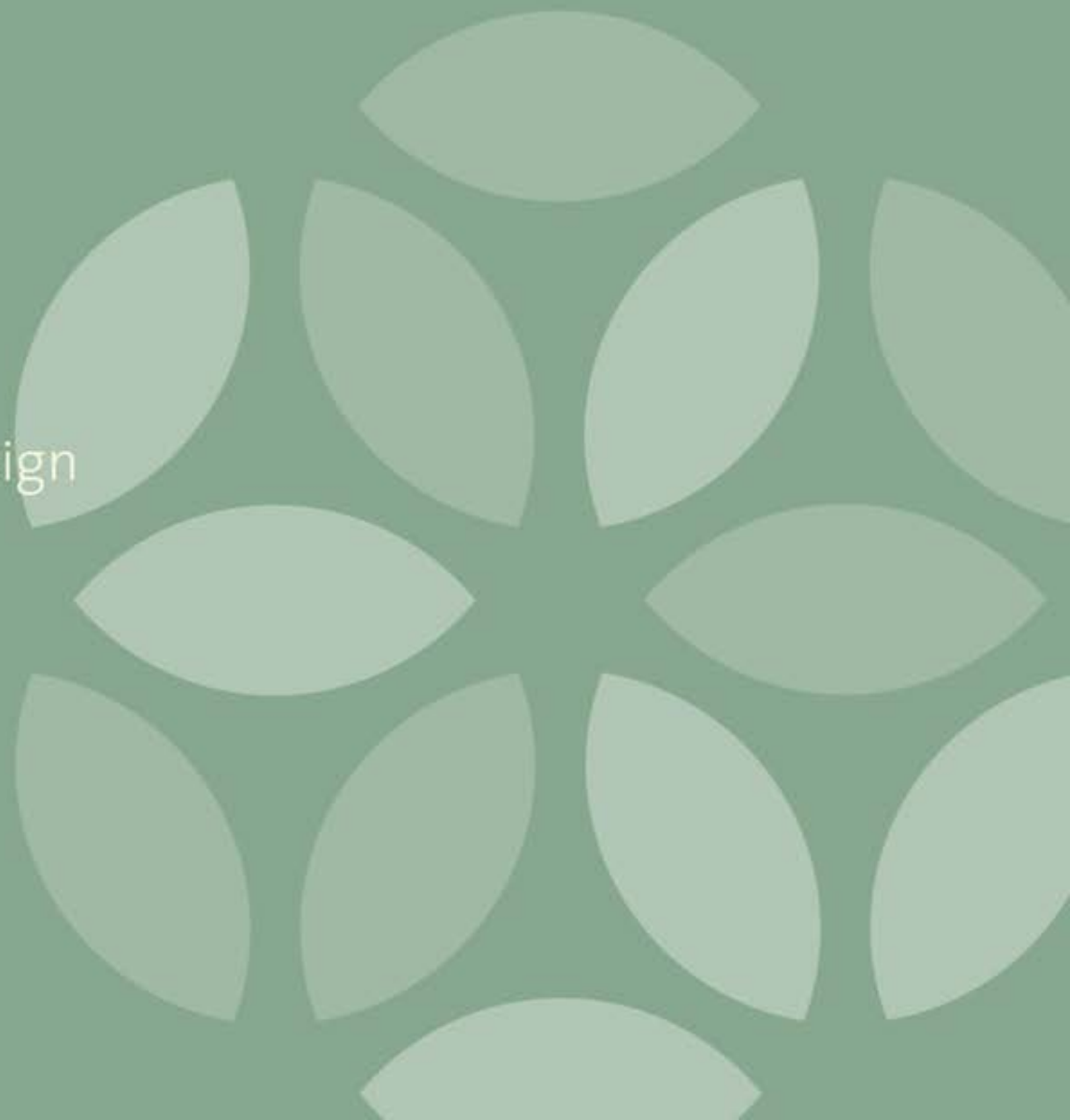
seeds

Ecology + Education + Design



seeds

Ecology + Education + Design



Why perform a Baseline Analysis?

- An analysis of where we are today is essential for setting reasonable and actionable targets for tomorrow.
- We can clearly see areas worth targeting to make significant progress toward our goals.
- We use this data to make accurate projections of various solution and scenario ideas.
- We also use this data to monitor our progress against the targets we set for ourselves.

We use Btu's as our metric.

The British thermal unit (Btu) is the standard unit used in the heating and cooling industry.

It is a standard measure of the quantity of heat from a given fuel source.

It is also used to sum or compare different fuel-sources of energy.

1 mmBtu = 1 million Btu's
= 10 therms of natural gas
= 1 mill cubic feet of nat. gas
= 11 gallons of propane
= 80 lbs of coal
= 7.2 gallons of gasoline
= 293 kWh of electricity

2011 6 County Regional Baseline

Total Energy Use in 2011

57,924,573 mmBtu

Energy Equivalent of

402 million gallons of gasoline

or

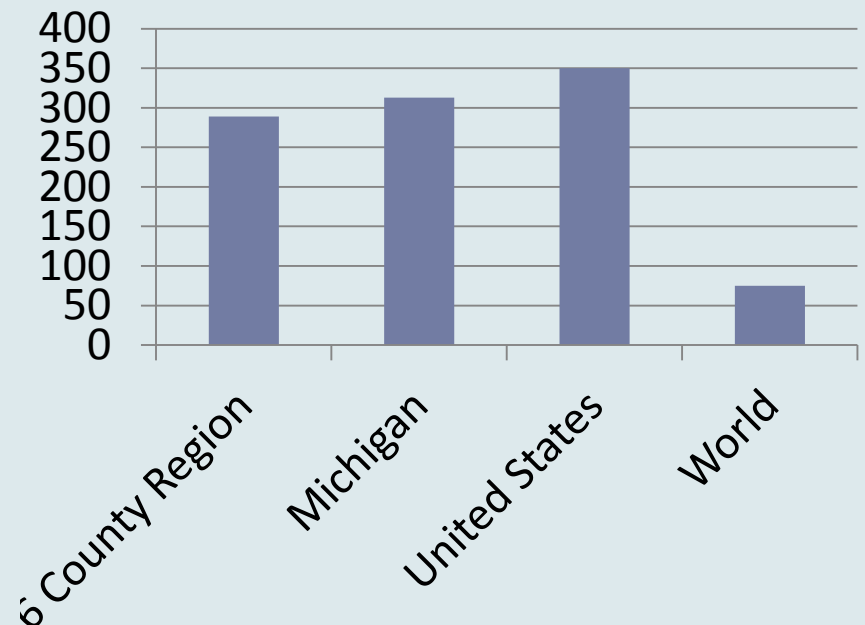
2.7 million tons of coal

or

4.9 billion kWh of electricity

Per Capita Comparison

mmBtu per Capita

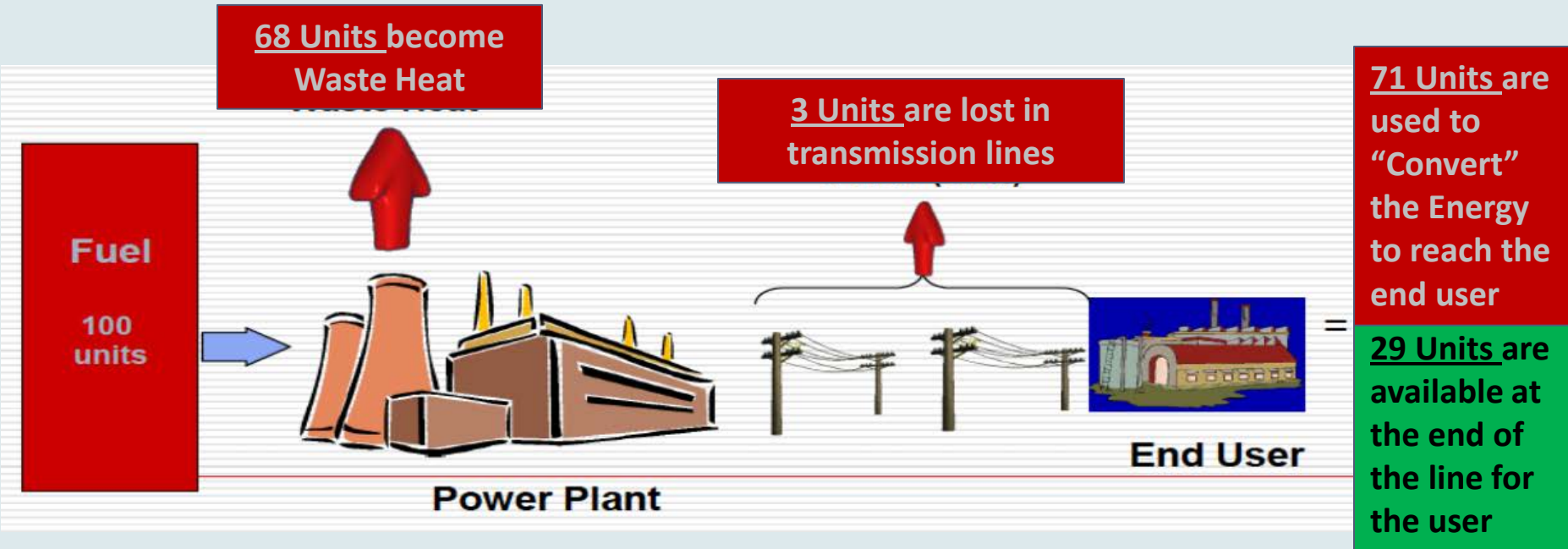


seeds

Ecology + Education + Design



“Source” Energy = “Conversion” + “Site” Energy



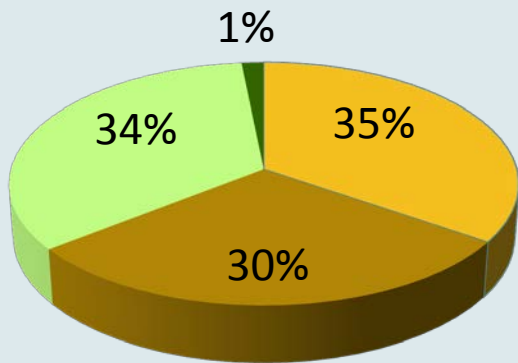
The industry standard term to describe the amount of fuel consumed to make power available to the End User is called *Conversion Energy*.

For every 100 Units of energy created, 29 Units are available to the consumer.

Distribution of Energy Use, Type & Cost

Energy Use % By Sector

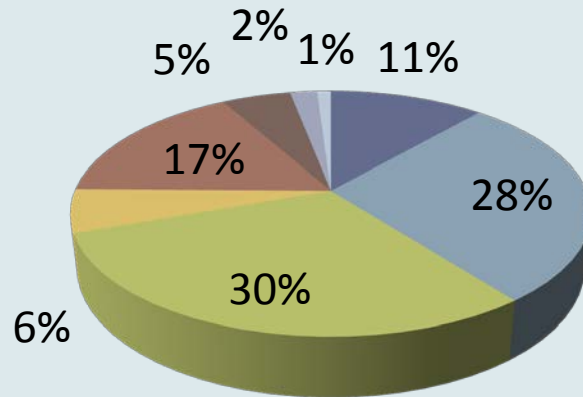
58 million mmBtu



- Residential - 35%
- Commercial / Industrial - 30%
- Trans - Non-Commercial - 34%
- Trans - Commercial - 2%

Energy Use % By Type

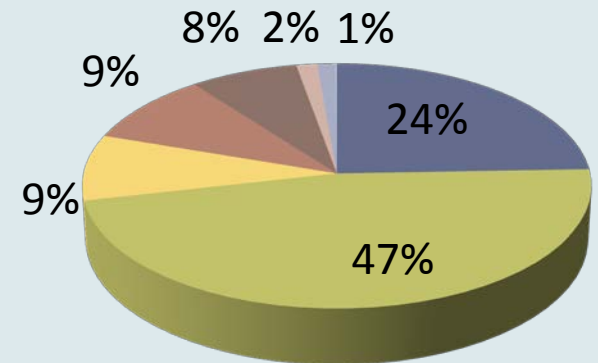
58 million mmBtu



- Electric - 11%
- Electric Conversion - 28%
- Gasoline - 30%
- Diesel - 6%
- Natural Gas - 17%
- Propane / LPG - 5%
- Wood - 2%
- All Other Fuels - 1%

Energy Cost % By Type

\$904 million

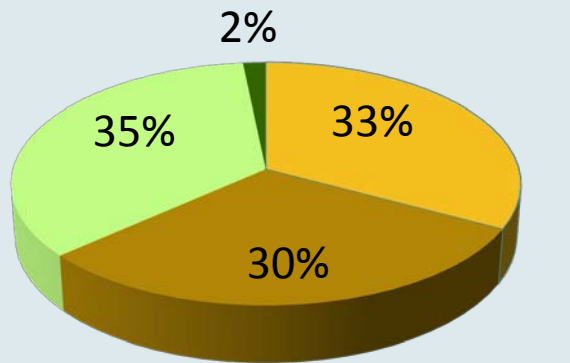


- Electricity - 24%
- Gasoline - 47%
- Diesel - 9%
- Natural Gas - 9%
- Propane / LPG - 8%
- Fuel Oil - 2%
- Wood - 1%
- All Other Fuels - <1%

Distribution of GHGs by Sector & Energy Type

GHG % By Sector

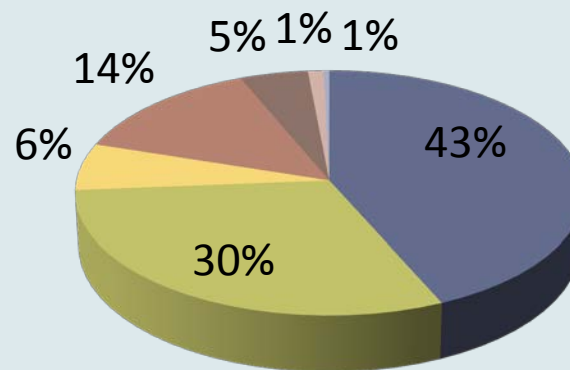
3.4 million MT CO₂-e



- Residential - 33%
- Commercial / Industrial - 30%
- Trans - Non-Commercial - 35%
- Trans - Commercial - 2%

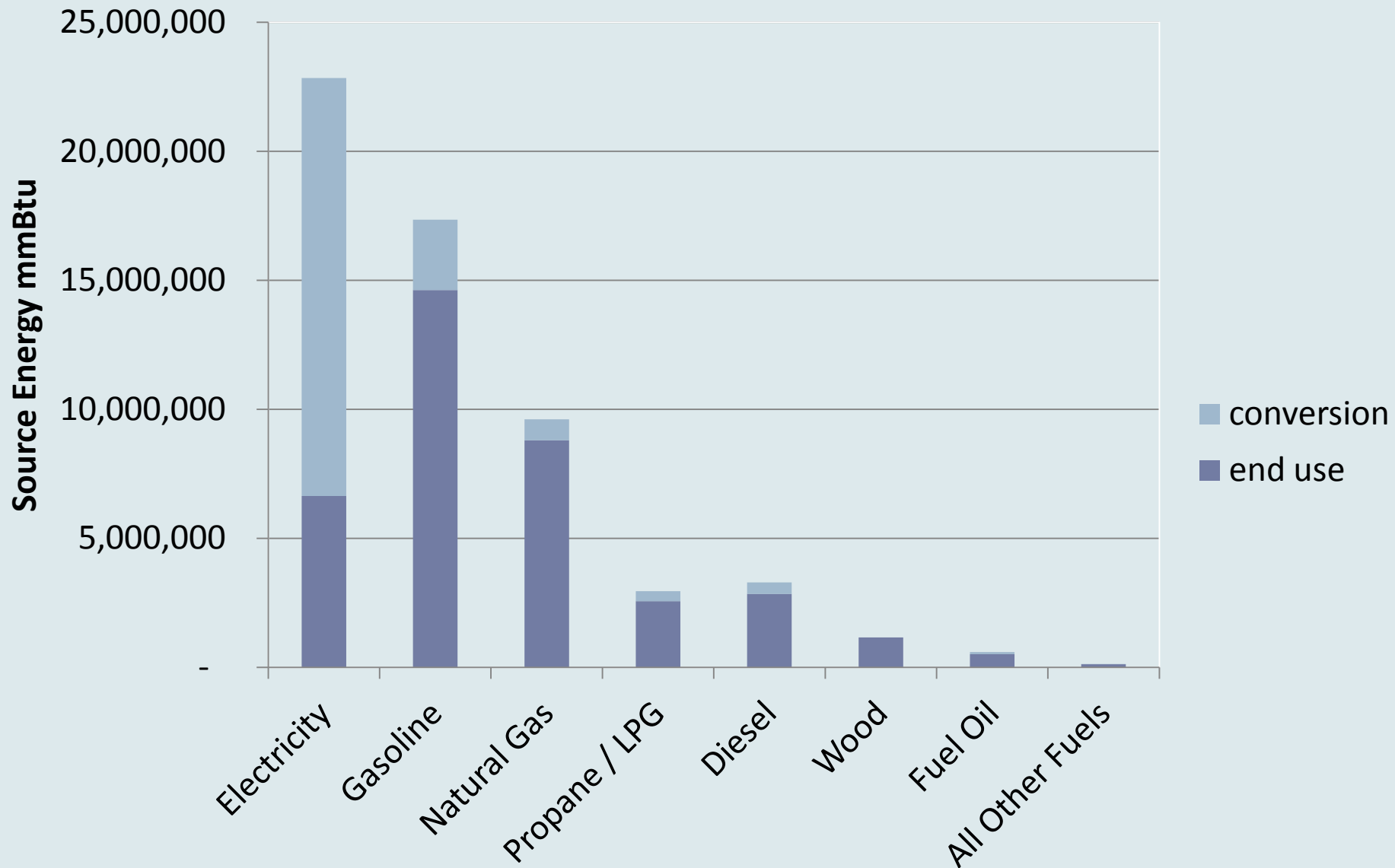
GHG % By Energy Type

3.4 million MT CO₂-e

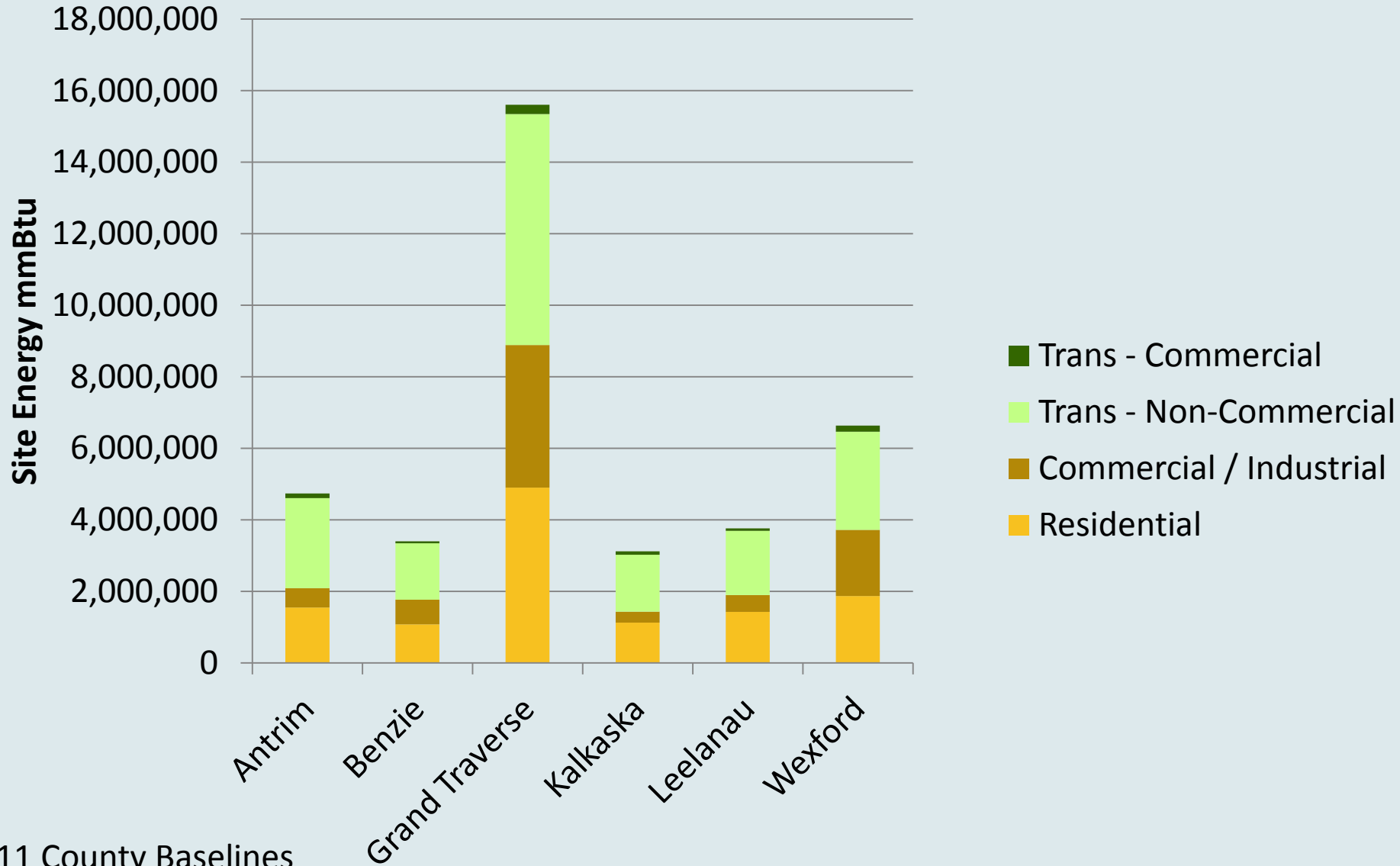


- Electricity - 43%
- Gasoline - 30%
- Diesel - 6%
- Natural Gas - 14%
- Propane / LPG - 5%
- Fuel Oil - 1%
- All Other Fuels - <1%

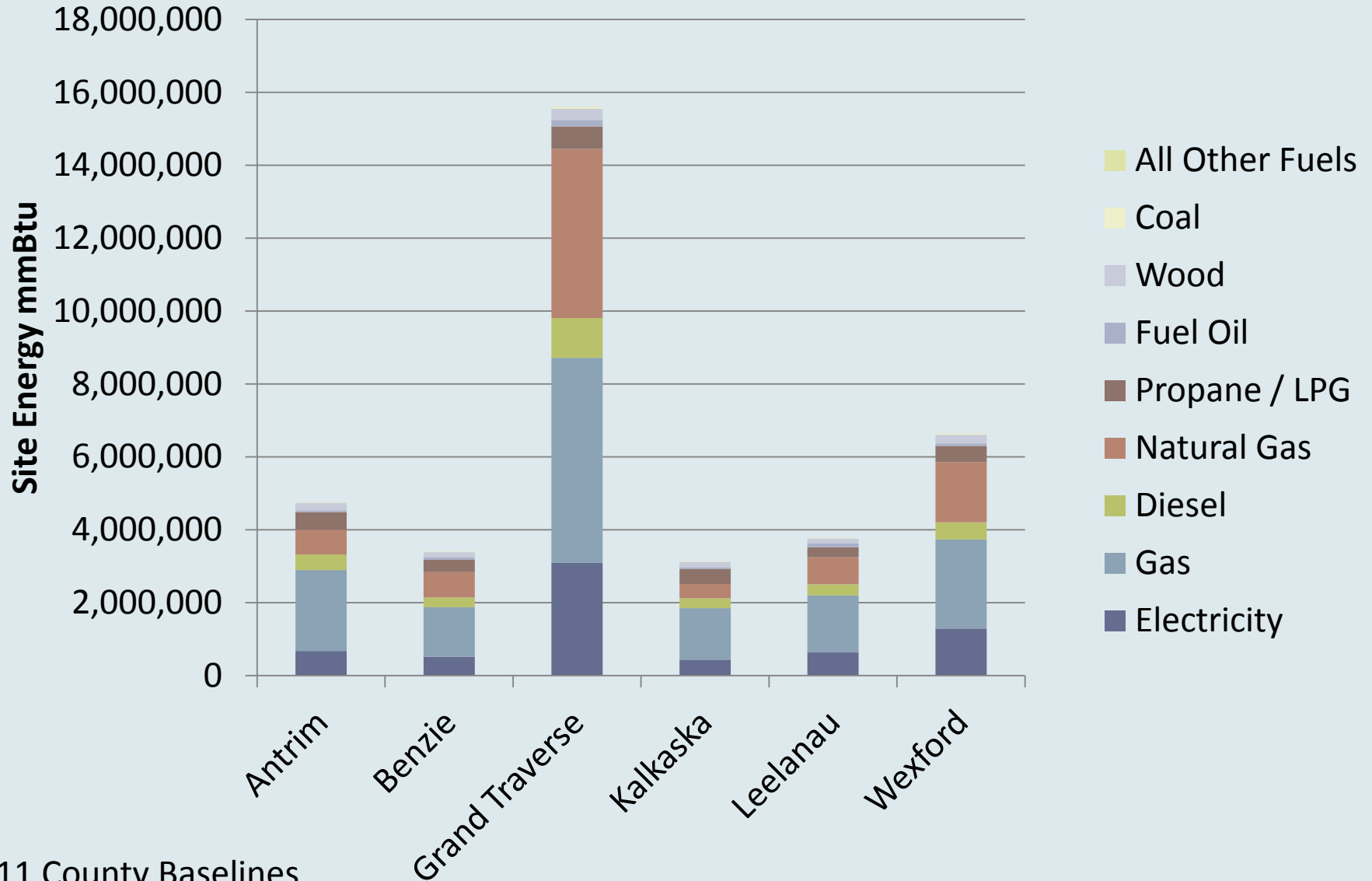
Conversion and End Use Energy by Type



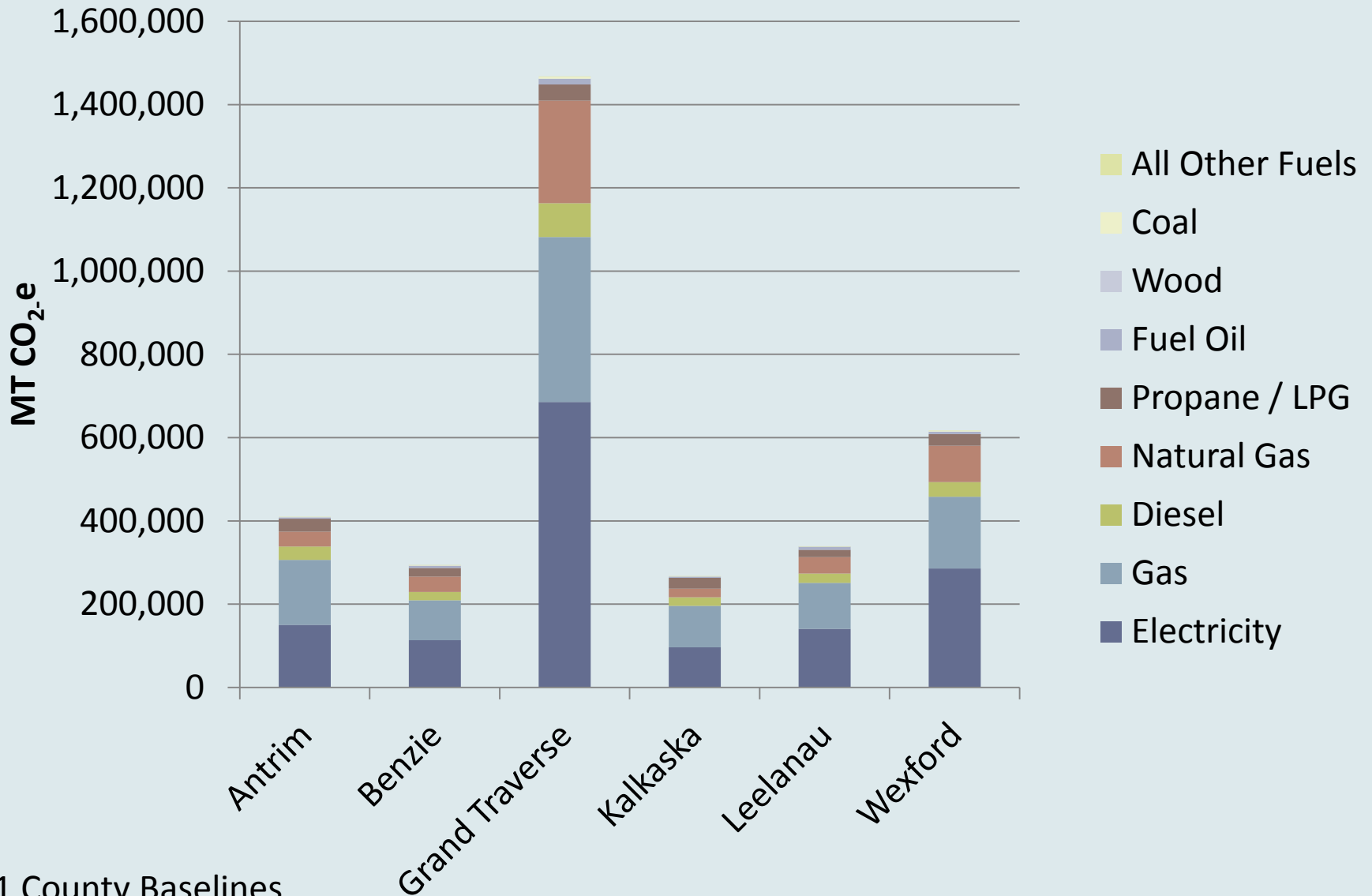
County Comparison by Sector



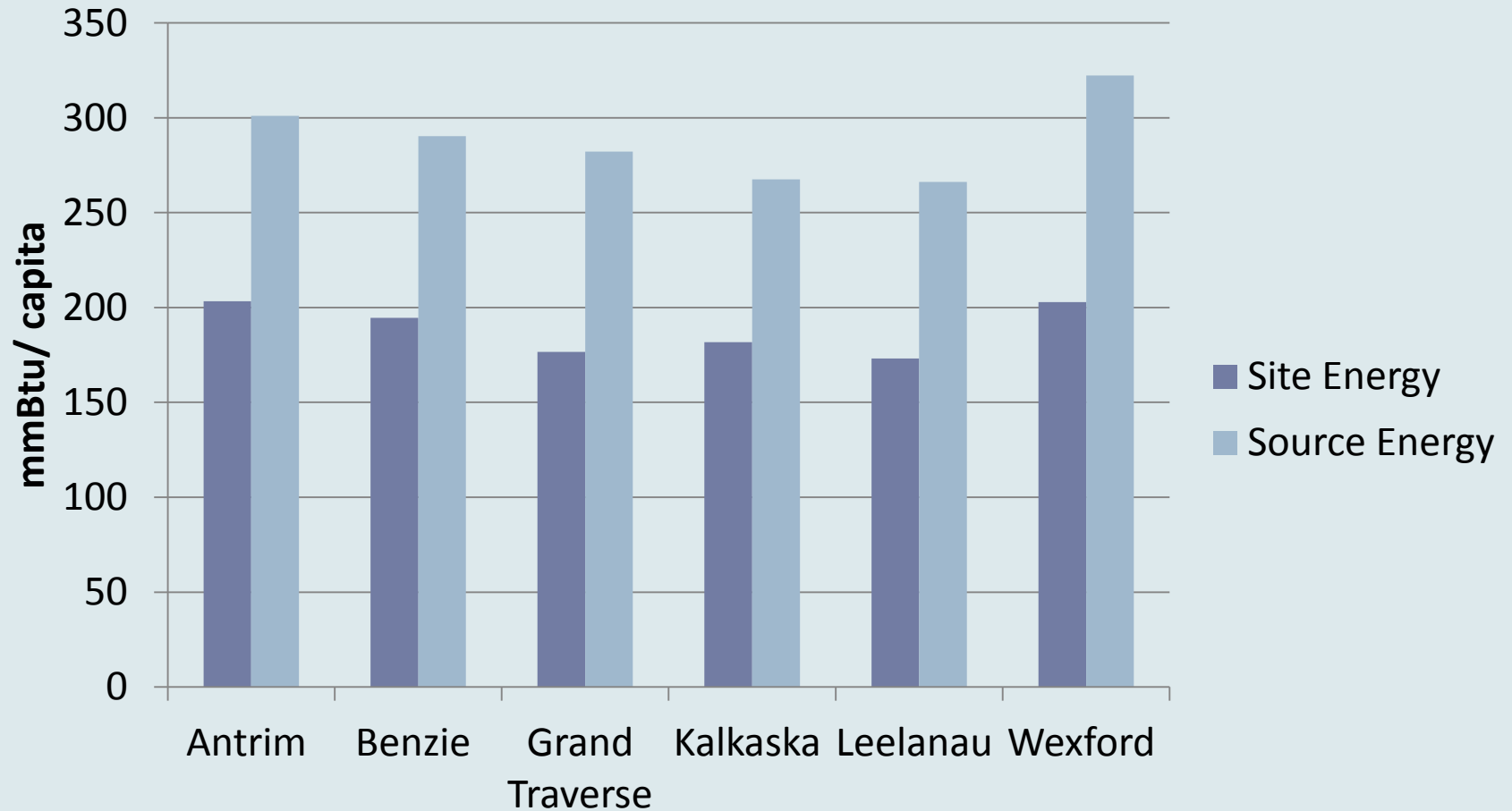
County Comparison by Type



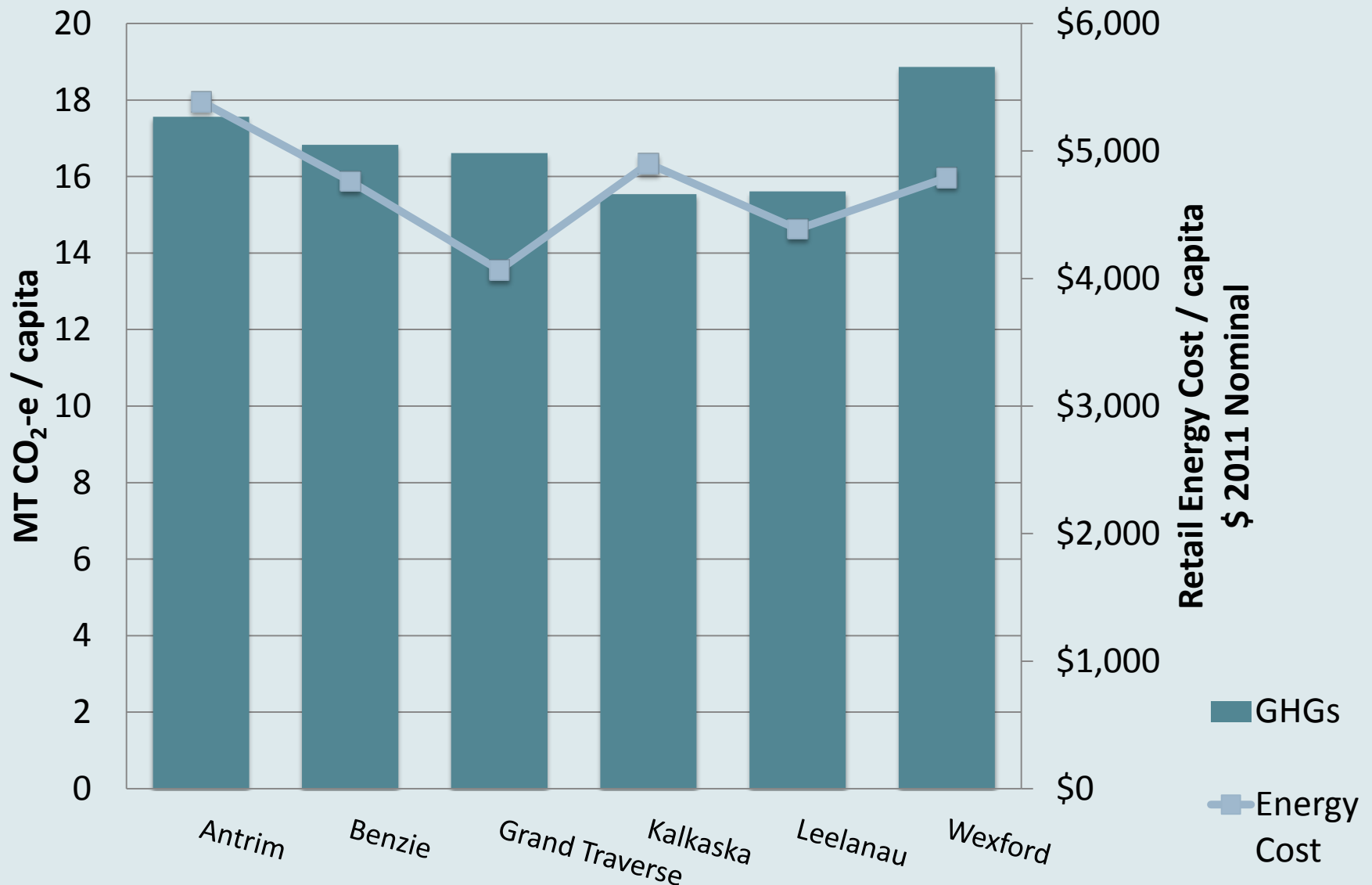
County Comparison of GHGs by Type



County Site and Source Energy Use per Capita

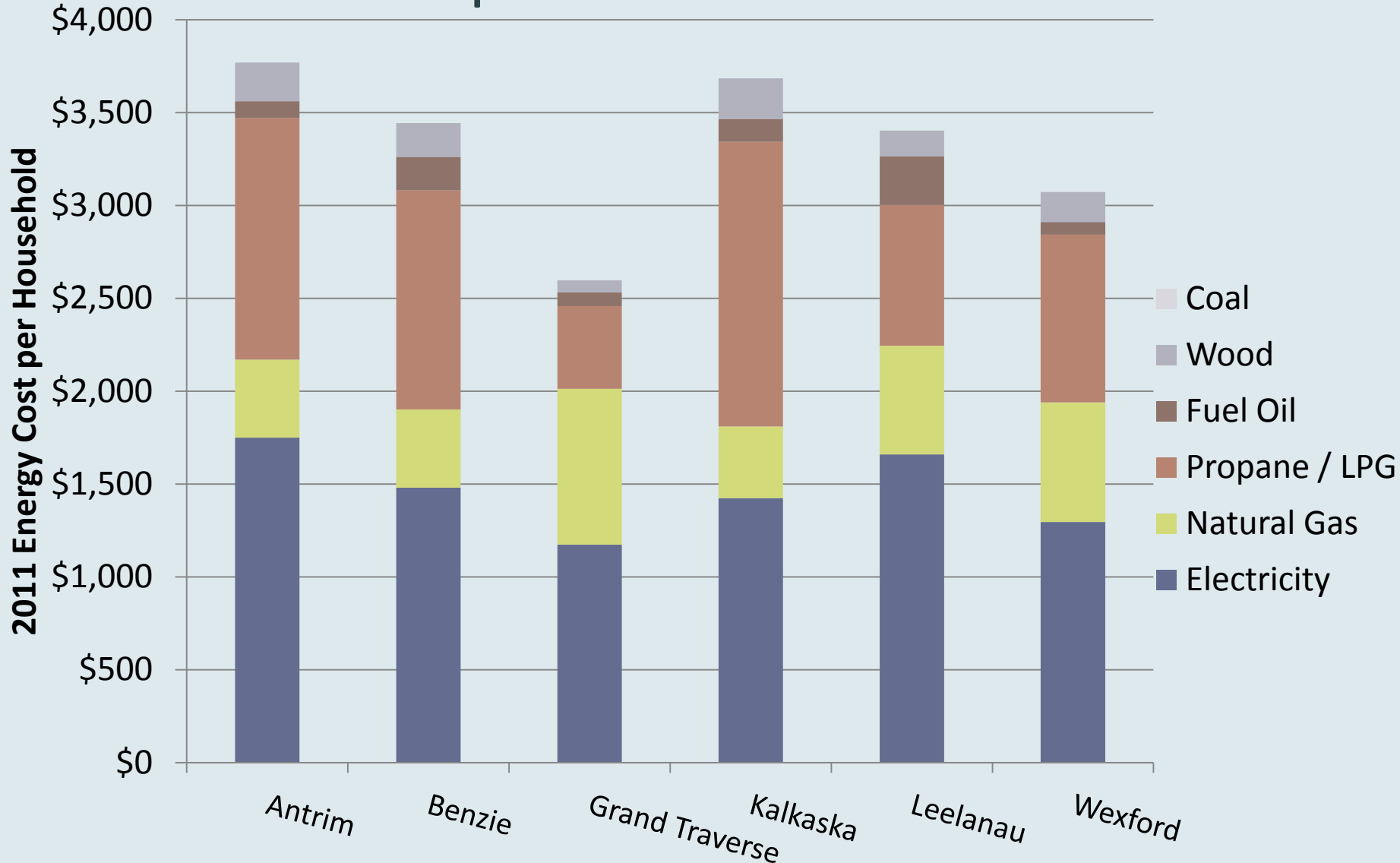


County GHGs and Energy Costs per Capita



2011 County Baselines

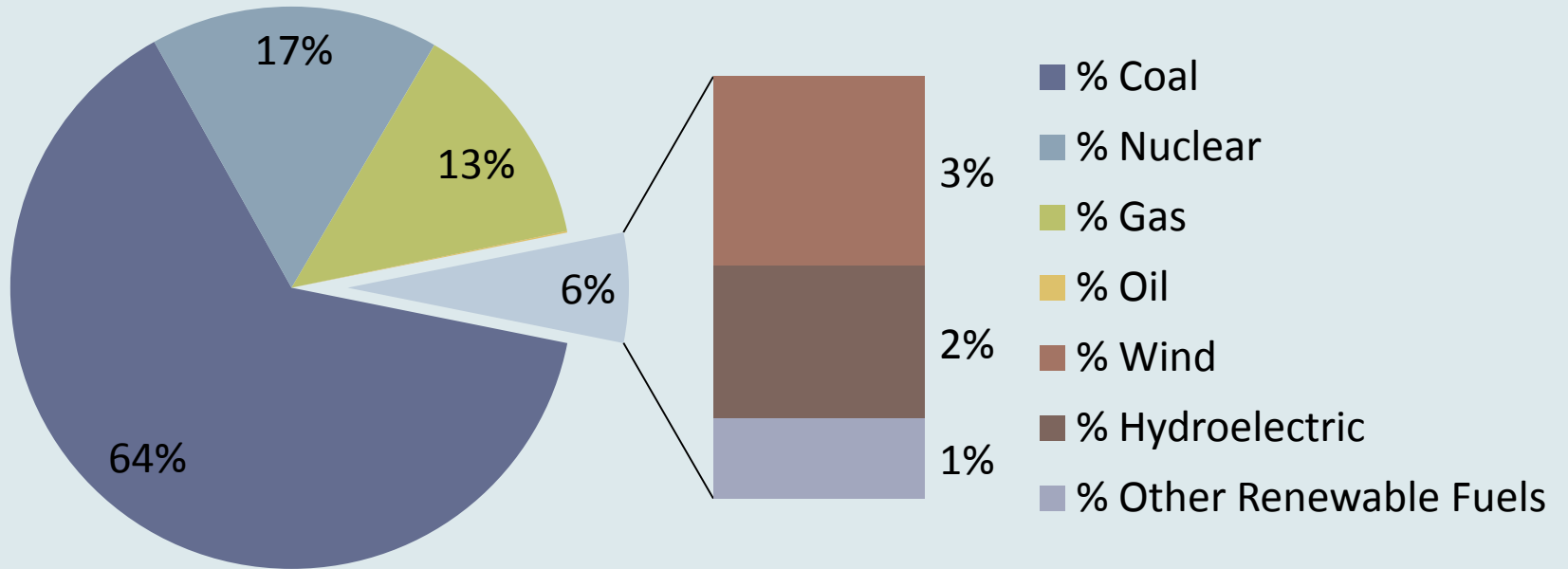
Residential Housing Energy Cost per Household



2011 County Baselines

6 County Electric % Generation Mix

2011 kWh of generation



Community Figures

- Total energy use by sector
- Total energy use by energy type
- Total energy cost by energy type
- Total emissions by sector
- Total emissions by energy type
- Comparison of end use to conversion energy by energy type
- Regional Electricity Profile
- eGRID Electricity Profile

County Figures

- County energy use by sector
- County energy use by energy type
- County site & source Energy, GHGs, and cost per capita
- Household energy costs by energy type

List of Figures in Final Report

seeds

Ecology + Education + Design



Data Sources

- Electricity
 - Consumers Energy, Great Lakes Energy, Cherryland Electric, and Traverse City Light & Power
- Natural Gas
 - DTE Energy
- Other Residential Heating Fuels
 - Estimated from US Census housing characteristics data
- Other Commercial Heating Fuels
 - Estimated from Michigan State distribution of commercial heating fuel use
- Transportation Fuels
 - Modeled using ICLEI's CACP 2009 software using Vehicle Miles Travelled from MDOT
- Energy Costs
 - Calculated from state average costs by fuel type provided by the US Energy Information Administration.
- GHG Emissions from Heating Fuels and Electricity
 - Calculated using emissions factors from the US Environmental Protection Agency eGRID 2012 and Climate Leaders 2011 edition
- GHG Emissions from Transportations
 - Calculated d using ICLEI's CACP 2009 software



Peer Review

This report's methodology was reviewed with approval by:



Eric Mackres

Local Policy Manager and Senior Researcher
American Council for and Energy Efficient Economy



seeds

Ecology + Education + Design



seeds

Ecology + Education + Design

